

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant: Brereton
Serial No.: 10/538,816
Filed: January 17, 2006
Group Art Unit: 3616
Examiner: Wilhelm, Timothy
Title: SUSPENSION TRAILING ARM

Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

APPEAL BRIEF

Dear Sir:

This paper is in response to the Notice of Non-Compliant Appeal Brief mailed June 29, 2009. Subsequent to the filing of the Notice of Appeal on April 1, 2009, Appellant hereby submits its brief. No additional fees are seen to be required as Applicant previously paid the Appeal Brief fee on June 1, 2009. Any additional fees or credits may be charged or applied to Deposit Account No. 50-1482 in the name of Carlson, Gaskey & Olds, P.C.

REAL PARTY IN INTEREST

The real party in interest is Meritor Heavy Vehicle Braking Systems (UK) Limited, the assignee of the entire right and interest in this Application.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claims 1, 3-15 and 37-50 are pending in this application. Claims 1, 3-15 and 37-50 stand finally rejected under 103(a). Claims 2 and 16-36 have been cancelled. Claims 1, 3-15 and 37-50 are being appealed.

STATUS OF AMENDMENTS

All amendments have been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 relates to a cast or forged suspension trailing arm 232, 323, 432, 532, 623, 723 for suspending a heavy vehicle chassis 25 from a beam-type axle 42 (page 5, lines 2 to 5 and page 5, line 27 to page 6, line 2). The cast or forged suspension trailing arm 232, 323, 432, 532, 623, 723 includes an integral axle locating formation 256, 356, 456, 556, 656, 756 to fully encircle a portion of a beam-type axle 42 (page 5, line 27 to page 6, line 2). The integral axle locating formation 256, 356, 456, 556, 656, 756 is part of a cast or forged suspension trailing arm 232, 323, 432, 532, 623, 723 (page 5, line 27 to page 6, line 2).

Claim 14 relates to suspension assembly including a beam-type axle 42 and a cast or forged suspension trailing arm 232, 323, 432, 532, 623, 723 including an integral axle locating formation 232, 432, 532 arranged to fully encircle a portion of the beam-type axle 42 (page 5, line 27 to page 6, line 2). The cast or forged suspension trailing arm 232, 323, 432, 532, 623, 723 is welded to the beam-type axle 42 at the integral axle locating formation 232, 323, 432, 532, 623, 723 with a weld (page 6, lines 16 to 20).

Claim 37 relates to a cast or forged suspension trailing arm 532 for suspending a heavy vehicle chassis 25 from a beam-type axle 42 (page 5, line 2 to 5). The cast or forged suspension trailing arm 532 includes a chassis mounting formation 546, an axle locating formation 556, and a section intermediate the chassis mounting formation 546 and the axle locating formation 556 having a substantially C-section profile and including a first flange 576 and a second flange 574 spaced by

a web 577. The chassis mounting formation 546 the axle locating formation 556 and the section are part of a cast or forged suspension trailing arm 532 (page 9, lines 5 to 11).

Claim 43 relates to a suspension trailing arm 332, 732 for suspending a heavy vehicle chassis 25 from a beam-type axle 42 (page 5, line 2 to 5). The suspension trailing arm 332, 732 includes a chassis mounting formation 346, 746, a first cast or forged component 352, 752 and a second component 354, 734. The first cast or forged component 352, 752 includes a first portion 356a, 756a of an axle locating formation 356, 756, and an integral arm portion extending between the first portion 356a, 756a of the axle locating formation 356, 756 and the chassis mounting formation 346, 746. The second component 354, 734 includes a second portion 356b, 756b of the axle locating formation 356, 756 and a bracket 350, 750 for mounting a spring. The first portion 356a, 756a and the second portion 356b, 756b of the axle locating formation 356, 756 mate together to fully encircle a portion of a beam-type axle 42 (page 7, lines 1 to 26).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

- A. Are Claims 1, 4-8, 12-15, 37-39 and 42-50 properly rejected under 35 U.S.C. 103(a) based on Frey (US6039336) in view of Pierce (US5203585)?
- B. Are claims 1, 8 and 9 properly rejected under 35 U.S.C. 103(a) based on Chalin (US7007960) in view of Pierce?
- C. Are claims 3, 10, 11, 40 and 41 properly rejected under 35 U.S.C. 103(a) based on Frey in view of Pierce?

ARGUMENTS

- A. Obviousness of Claims 1, 4-8, 12-15, 37-39 and 42-50 based on Frey in view of Pierce.

Claims 1, 4, 12 and 13

Claims 4-8, 12-15, 37-39 and 42-50 are rejected under 35 U.S.C. 103(a) as being obvious over Frey in view of Pierce. The Examiner states that Frey does not disclose a trailing arm that is

cast or forged. The Examiner states that Pierce discloses this feature, and it would be obvious to modify the trailing arm of Frey to be cast or forged because of Pierce to better ensure a high strength of the trailing arm. Appellant respectfully disagrees.

The claimed invention is not obvious. There is no reason to form the axle body 1 of Frey of a cast or forged part. Frey states that an object of Frey is that “the radius arm is in the form of a box-shaped body including a bottom wall and two side walls extending, for example, perpendicularly therefrom. The side walls are spaced from each other in the axial direction of the axle body” (column 2, lines 11 to 16). This provides a low weight and sufficient rigidity (column 2, lines 19 to 21). That is, the radius arm 2 (suspension arm) is hollow. That is, Frey discloses and relates to a very specific method of forming the radius arm 2. If the radius arm 2 was cast or forged as claimed, these required manufacturing features would be not be possible. It is impermissible to modify a base reference in a manner that defeats the purpose of the base reference.

The Examiner asserts that the skilled person would modify the trailing arm of Frey with the teaching of Pierce to make it as a cast or forged trailing arm because this would better ensure a high strength of the trailing arm. However, nothing in Pierce discloses that casting or forging provides the benefit of high strength. Therefore, the Examiner has not demonstrated that the skilled person has the motivation to make this combination. Furthermore, if that motivation did exist, it would appear that there would be significant technical barriers in manufacturing the trailing arms shown in Frey (that are hollow box sections). Forging or casting processes do not lend themselves to making such shapes.

The Examiner further states that the claimed recitation that the suspension trailing arm is “cast or forged” is not given patentable weight as it is a method of forming the trailing arm. However, Appellant is not claiming a method of making the suspension trailing arm. Appellant is reciting a structural feature of the suspension trailing arm. That is, the recitation “cast or forged” is a structural feature and should be given patentable weight.

Additionally, Frey does not disclose a forged suspension trailing arm including an integral axle locating formation that fully encircles an axle. In Frey, as shown in Figure 1, the axle 1 is not

fully encircled by an axle locating formation as a bottom portion of the axle 1 is exposed. Frey also discloses that an object of Frey is that “the radius arm does not entirely encompass the axle body. Rather, the radius arm encompasses only at least a portion of the axle body in the direction of the circumference thereof” (column 1, lines 44 to 48). Additionally, the reinforced wall region 7 cannot be considered to be an axle locating formation as it is not part of the radius arm 2. Figures 2a and 2b also does not disclose this features as the left side of the axle 1 is exposed, so the axle locating portion does not fully encircle the axle. The claimed invention is not obvious.

Claims 5 to 7

The rejection of claims 5 to 7 is separately contested from the rejection of claim 1. Claim 5 recites that the integral axle locating formation is formed from a first section and a second section. The Examiner asserts that Frey discloses a first section including a portion of the axle locating formation and the chassis mounting formation and a second section including another portion of the axle locating formation, and a bracket for mounting a spring. Frey discloses a single contiguous section includes all these portions, and therefore there is no second section. The claimed invention is not obvious.

Claim 8

The rejection of Claim 8 is separately contested from the rejection of claim 1. Claim 8 recites that a section of the cast or forged suspension trailing arm between the chassis mounting formation and the integral axle locating formation has one of a substantially I-shaped profile and a substantially C-shaped profile and includes a first flange and a second flange spaced by a web. The Examiner states that the trailing arm of Figure 1 of Frey is C-shaped and notes the portion of the trailing arm labeled by reference numeral 6 has a c-shape cross-section as may be viewed by the end of the trailing arm. However, Appellant is claiming that the portion *between* a chassis mounting feature and an axle locating formation has a c-section. If the Examiner is interpreting the c-shaped portion as being the portion that partially encircles the axle, then the Applicant notes the c-shaped portion of

Frey is located at the chassis mounting feature, not between the chassis mounting feature and the axle locating formation and, furthermore, this is not a "profile". If the Examiner is interpreting the "c" as being just the "n"-shaped component 6 in Figure 1, then the Applicant notes that "n" is not the same shape as a "c" and, furthermore, the complete arm is "in the form of a box shaped body" (column 3, lines 1 and 2). The Examiner simply cannot ignore the bottom wall 6 of the trailing arm 2. Additionally, the section of Figure 1 of the trailing arm 2 of Frey does not include a first flange and a second flange separated by a web.

Claims 14-15

Claims 14-15 are rejected under 35 U.S.C. 103(a) as being obvious over Frey in view of Pierce. The Examiner states that Frey does not disclose a trailing arm that is cast or forged. The Examiner states that Pierce discloses this feature, and it would be obvious to modify the trailing arm of Frey to be cast or forged because of Pierce to better ensure a high strength of the trailing arm. Appellant respectfully disagrees.

The claimed invention is not obvious. There is no reason to form the axle body 1 of Frey of a cast or forged part. Frey states that an object of Frey is that "the radius arm is in the form of a box-shaped body including a bottom wall and two side walls extending, for example, perpendicularly therefrom. The side walls are spaced from each other in the axial direction of the axle body" (column 2, lines 11 to 16). This provides a low weight and sufficient rigidity (column 2, lines 19 to 21). That is, the radius arm 2 (suspension arm) is hollow. That is, Frey discloses and relates to a very specific method of forming the radius arm 2. If the radius arm 2 was cast or forged as claimed, these required manufacturing features would be not be possible. It is impermissible to modify a base reference in a manner that defeats the purpose of the base reference.

The Examiner asserts that the skilled person would modify the trailing arm of Frey with the teaching of Pierce to make it as a cast or forged trailing arm because this would better ensure a high strength of the trailing arm. However, nothing in Pierce discloses that casting or forging provides the benefit of high strength. Therefore, the Examiner has not demonstrated that the skilled person has

the motivation to make this combination. Furthermore, if that motivation did exist, it would appear that there would be significant technical barriers in manufacturing the trailing arms shown in Frey (that are hollow box sections). Forging or casting processes do not lend themselves to making such shapes.

The Examiner further states that the claimed recitation that the suspension trailing arm is “cast or forged” is not given patentable weight as it is a method of forming the trailing arm. However, Appellant is not claiming a method of making the suspension trailing arm. Appellant is reciting a structural feature of the suspension trailing arm. That is, the recitation “cast or forged” is a structural feature and should be given patentable weight.

Additionally, Frey does not disclose a forged suspension trailing arm including an integral axle locating formation that fully encircles an axle. In Frey, as shown in Figure 1, the axle 1 is not fully encircled by an axle locating formation as a bottom portion of the axle 1 is exposed. Frey also discloses that an object of Frey is that “the radius arm does not entirely encompass the axle body. Rather, the radius arm encompasses only at least a portion of the axle body in the direction of the circumference thereof” (column 1, lines 44 to 48). Additionally, the reinforced wall region 7 cannot be considered to be an axle locating formation as it is not part of the radius arm 2. Figures 2a and 2b also does not disclose this features as the left side of the axle 1 is exposed. The claimed invention is not obvious.

Claims 37 and 42

Claim 37 is also not obvious. The Examiner states that Frey does not disclose a trailing arm that is cast or forged. The Examiner states that Pierce discloses this feature, and it would be obvious to modify the trailing arm of Frey to be cast or forged because of Pierce to better ensure a high strength of the trailing arm. Appellant respectfully disagrees.

The claimed invention is not obvious. There is no reason to form the axle body 1 of Frey of a cast or forged part. Frey states that an object of Frey is that “the radius arm is in the form of a box-shaped body including a bottom wall and two side walls extending, for example, perpendicularly

therefrom. The side walls are spaced from each other in the axial direction of the axle body” (column 2, lines 11 to 16). This provides a low weight and sufficient rigidity (column 2, lines 19 to 21). That is, the radius arm 2 (suspension arm) is hollow. That is, Frey discloses and relates to a very specific method of forming the radius arm 2. If the radius arm 2 was cast or forged as claimed, these required manufacturing features would be not be possible. It is impermissible to modify a base reference in a manner that defeats the purpose of the base reference.

The Examiner asserts that the skilled person would modify the trailing arm of Frey with the teaching of Pierce to make it as a cast or forged trailing arm because this would better ensure a high strength of the trailing arm. However, nothing in Pierce discloses that casting or forging provides the benefit of high strength. Therefore, the Examiner has not demonstrated that the skilled person has the motivation to make this combination. Furthermore, if that motivation did exist, it would appear that there would be significant technical barriers in manufacturing the trailing arms shown in Frey (that are hollow box sections). Forging or casting processes do not lend themselves to making such shapes.

The Examiner further states that the claimed recitation that the suspension trailing arm is “cast or forged” is not given patentable weight as it is a method of forming the trailing arm. However, Appellant is not claiming a method of making the suspension trailing arm. Appellant is reciting a structural feature of the suspension trailing arm. That is, the recitation “cast or forged” is a structural feature and should be given patentable weight.

The Examiner states that the trailing arm of Figure 1 of Frey is C-shaped and notes the portion of the trailing arm labeled by reference numeral 6 has a c-shape cross-section as may be viewed by the end of the trailing arm. However, Appellant is claiming that the portion *between* a chassis mounting feature and an axle locating formation has a c-section. If the Examiner is interpreting the c-shaped portion as being the portion that partially encircles the axle, then the Applicant notes the c-shaped portion of Frey is located at the chassis mounting feature, not between the chassis mounting feature and the axle locating formation and, furthermore, this is not a “profile”. If the Examiner is interpreting the “c” as being just the “n”-shaped component 6 of Figure 1, then the

Applicant notes that “n” is not the same shape as a “c” and, furthermore, the complete arm is “in the form of a box shaped body” (column 3, lines 1 and 2). The Examiner simply cannot ignore the bottom wall 6 of the arm. Additionally, the section of Figure 1 of the trailing arm of Frey does not include a first flange and a second flange separated by a web.

Claim 38

The rejection of claim 38 is separately contested from the rejection of claim 37. Claim 38 recites that the axle locating formation fully encircles a beam-type axle. Frey does not disclose a forged suspension trailing arm including an integral axle locating formation that fully encircles an axle. In Frey, as shown in Figure 1, the axle 1 is not fully encircled by an axle locating formation as a bottom portion of the axle 1 is exposed. Frey also discloses that an object of Frey is that “the radius arm does not entirely encompass the axle body. Rather, the radius arm encompasses only at least a portion of the axle body in the direction of the circumference thereof” (column 1, lines 44 to 48). Additionally, the reinforced wall region 7 cannot be considered to be an axle locating formation as it is not part of the radius arm 2. Figures 2a and 2b also does not disclose this features as the left side of the axle 1 is exposed. The claimed invention is not obvious.

Claim 39

The rejection of claim 39 is separately contested. Claim 39 recites that the integral axle locating formation is formed from a first section and a second section. The Examiner asserts that Frey discloses a first section including a portion of the axle locating formation and the chassis mounting formation and a second section including another portion of the axle locating formation, and a bracket for mounting a spring. In Frey, a single contiguous section includes all these portions, and therefore there is no second section.

Claims 43-46 and 49-50

Claims 43 - 46 and 49 - 50 are rejected under 35 U.S.C. 103(a) as being obvious over Frey in view of Pierce. The Examiner states that Frey does not disclose a trailing arm that is cast or forged. The Examiner states that Pierce discloses this feature, and it would be obvious to modify the trailing arm of Frey to be cast or forged because of Pierce to better ensure a high strength of the trailing arm. Appellant respectfully disagrees.

The claimed invention is not obvious. There is no reason to form the axle body 1 of Frey of a cast or forged part. Frey states that an object of Frey is that "the radius arm is in the form of a box-shaped body including a bottom wall and two side walls extending, for example, perpendicularly therefrom. The side walls are spaced from each other in the axial direction of the axle body" (column 2, lines 11 to 16). This provides a low weight and sufficient rigidity (column 2, lines 19 to 21). That is, the radius arm 2 (suspension arm) is hollow. That is, Frey discloses and relates to a very specific method of forming the radius arm 2. If the radius arm 2 was cast or forged as claimed, these required manufacturing features would be not be possible. It is impermissible to modify a base reference in a manner that defeats the purpose of the base reference.

The Examiner asserts that the skilled person would modify the trailing arm of Frey with the teaching of Pierce to make it as a cast or forged trailing arm because this would better ensure a high strength of the trailing arm. However, nothing in Pierce discloses that casting or forging provides the benefit of high strength. Therefore, the Examiner has not demonstrated that the skilled person has the motivation to make this combination. Furthermore, if that motivation did exist, it would appear that there would be significant technical barriers in manufacturing the trailing arms shown in Frey (that are hollow box sections). Forging or casting processes do not lend themselves to making such shapes.

The Examiner further states that the claimed recitation that the suspension trailing arm is "cast or forged" is not given patentable weight as it is a method of forming the trailing arm. However, Appellant is not claiming a method of making the suspension trailing arm. Appellant is

reciting a structural feature of the suspension trailing arm. That is, the recitation “cast or forged” is a structural feature and should be given patentable weight.

Frey does not disclose distinct first and second components. In particular, there is no second component having a second portion of an axle locating formation and a bracket for mounting a spring.

Additionally, Frey does not disclose a forged suspension trailing arm including an integral axle locating formation that fully encircles an axle. In Frey, as shown in Figure 1, the axle 1 is not fully encircled by an axle locating formation as a bottom portion of the axle 1 is exposed. Frey also discloses that an object of Frey is that “the radius arm does not entirely encompass the axle body. Rather, the radius arm encompasses only at least a portion of the axle body in the direction of the circumference thereof” (column 1, lines 44 to 48). Additionally, the reinforced wall region 7 cannot be considered to be an axle locating formation as it is not part of the radius arm 2. Figures 2a and 2b also do not disclose this features as the left side of the axle 1 is exposed. The claimed invention is not obvious.

Claims 47 and 48

The rejection of claims 47 and 48 is separately contested from the rejection of claim 43. Claim 48 recites that the first portion and the second portion of the axle locating formation mate together at corresponding edges above and below the beam-type axle. The Examiner has not provided evidence that “it is well known in the art form trailing arms from multiple parts welded together.” Additionally, the claim is not directed merely to welding parts together, but to the specific location of the welds above and below the axle. This is advantageous as this makes it easier to assemble a two-piece trailing arm together with the axle, which is not taught in the prior art. The claimed invention is not obvious.

B. Obviousness of Claims 1, 8 and 9 based on Chalin et al. in view of Pierce.

Claim 1

Claims 1, 8 and 9 are rejected under 35 U.S.C. 103(a) as being obvious over Chalin et al. in view of Pierce. The Examiner states that Chalin et al. does not disclose a trailing arm that is cast or forged. The Examiner states that Pierce discloses this feature, and it would be obvious to modify the trailing arm of Chalin et al. to be cast or forged because of Pierce to better ensure a high strength of the trailing arm. Appellant respectfully disagrees.

Chalin et al. does not show an axle locating formation that is integral with the trailing arm. Chalin et al. discloses that a sleeve 32 is welded to the axle 12 before the arm 14 is welded to the sleeve 32 (column 3, lines 46 to 52 and column 4, lines 1 to 3). Therefore, the two components cannot be integral. That is, the sleeve 32 is not integral with the arm 14.

Finally, there is no motivation to combine the disclosure of Chalin et al. with Pierce for the same reasons as set out above regarding the Frey/Pierce combination. Similarly, even if there were motivation, the task of adapting Chalin et al. by use of a casting or forging process would present considerable, if not insurmountable, practical difficulties which would dissuade the skilled person from making such a combination.

Claims 8 to 9

The rejection of Claims 8 to 9 is separately contested. Claim 8 recites that a section of the cast or forged suspension trailing arm between the chassis mounting formation and the integral axle locating formation has one of a substantially I-shaped profile and a substantially C-shaped profile and includes a first flange and a second flange spaced by a web. Chalin does not disclose a C-section profile as required in claim 8. With reference to Figures 11 and 12, the profiles have a box-section. The bottom plate 24, which forms part of the profile between the chassis mounting formation and the axle locating formation, cannot be ignored when considering the profile shape. However, even if this plate is ignored, the term "c-shaped" can be distinguished from the top plate 20 and side wall 22 portion of Chalin which is in effect "n-shaped", or an inverted "u-shaped" (column

3, line 9). C-shaped specifically means with reference to the orientation of the arm in use. The arm has a vertical web and horizontal flanges, rather than the horizontal web and vertical flanges of a "u" or "n"-shape. The claimed invention is not obvious.

C. Obviousness of claims 3, 10, 11, 40 and 41 based on Frey in view of Pierce.

Claim 3, 40 and 41

The rejection of claim 3 is separately contested from the rejection of claim 1. Claim 3 recites that a thickness of the cast or forged suspension trailing arm above the integral axle locating formation is less than 50 mm. Nothing in either reference suggests that this thickness provides any benefit or recognizes the possibility of any benefit from this thickness. The claimed invention is not obvious.

Claims 10 and 11

The rejection of claims 10 and 11 is separately rejected from the rejection of claim 1. Claims 10 and 11 depend on patentable independent claim 8 and are allowable for the reasons set forth above with respect to claim 8.

CONCLUSION

For the reasons set forth above, the rejection of all claims is improper and should be reversed. Appellant respectfully requests such an action.

Respectfully Submitted,
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Dated: July 8, 2009

CLAIM APPENDIX

1. A cast or forged suspension trailing arm for suspending a heavy vehicle chassis from a beam-type axle, the cast or forged suspension trailing arm comprising:
an integral axle locating formation to fully encircle a portion of a beam-type axle, wherein the integral axle locating formation is part of a cast or forged suspension trailing arm.
3. The cast or forged suspension trailing arm according to Claim 1 wherein a thickness of the cast or forged suspension trailing arm above the integral axle locating formation is less than 50 mm.
4. The cast or forged suspension trailing arm according to Claim 1 further including a chassis mounting formation, wherein the integral axle locating formation is integral with the chassis mounting formation to facilitate mounting the cast or forged suspension trailing arm to a chassis component of a vehicle.
5. The cast or forged suspension trailing arm according to Claim 1 wherein the integral axle locating formation is formed from a first section and a second section.
6. The cast or forged suspension trailing arm according to Claim 5 wherein the first section includes a portion of the integral axle locating formation and a chassis mounting formation that facilitates mounting the cast or forged suspension trailing arm to a chassis component.
7. The cast or forged suspension trailing arm according to Claim 5 wherein the second section includes a portion of the integral axle locating formation and a bracket for mounting a spring.

8. The cast or forged suspension trailing arm according to Claim 1 further including a chassis mounting formation, wherein a section of the cast or forged suspension trailing arm between the chassis mounting formation and the integral axle locating formation has one of a substantially I-shaped profile and a substantially C-shaped profile and includes a first flange and a second flange spaced by a web.
9. The cast or forged suspension trailing arm according to Claim 8 wherein the integral axle locating formation includes an opening near the web and inboard of the web.
10. The cast or forged suspension trailing arm according to Claim 8 wherein a bending strength of the one of the substantially I-shaped profile and the substantially C-shaped profile is greater near the integral axle locating formation than near the chassis mounting formation.
11. The cast or forged suspension trailing arm according to Claim 10 wherein at least one of a flange thickness, a web thickness, a flange width and a web depth of the cast or forged suspension trailing arm is different near the integral axle locating formation with respect to the chassis mounting formation to achieve a difference in the bending strength.
12. The cast or forged suspension trailing arm according to Claim 1 including an integral damper mounting formation for one of a suspension damper and a shock absorber.
13. The cast or forged suspension trailing arm according to Claim 1 wherein the cast or forged suspension trailing arm includes at least one of a recessed portion, a concave portion, and a convex portion to facilitate fitment of one of an additional suspension component and a braking component near the cast or forged suspension trailing arm.

14. A suspension assembly comprising:
a beam-type axle; and
a cast or forged suspension trailing arm including an integral axle locating formation arranged to fully encircle a portion of the beam-type axle, wherein the cast or forged suspension trailing arm is welded to the beam-type axle at the integral axle locating formation with a weld.
15. The suspension assembly according to Claim 14 wherein the weld carries a portion of a vertical load from the beam-type axle to the cast or forged suspension trailing arm.
37. A cast or forged suspension trailing arm for suspending a heavy vehicle chassis from a beam-type axle, the cast or forged suspension trailing arm comprising:
a chassis mounting formation;
an axle locating formation;
a section intermediate the chassis mounting formation and the axle locating formation having a substantially C-section profile and including a first flange and a second flange spaced by a web, wherein the chassis mounting formation, the axle locating formation and the section are part of a cast or forged suspension trailing arm.
38. The cast or forged suspension trailing arm according to Claim 37 wherein the axle locating formation fully encircles a beam-type axle.
39. The cast or forged suspension trailing arm according to Claim 37 including a first section and a second section joined at the axle locating formation.
40. The cast or forged suspension trailing arm according to Claim 3 wherein the thickness is less than 30 mm.

41. The cast or forged suspension trailing arm according to Claim 40 wherein the thickness is less than 20 mm.
42. The cast or forged suspension trailing arm according to Claim 37 wherein the substantially C-section profile is defined by a cross-section taken transverse to a longitudinal axis of the cast or forged suspension trailing arm.
43. A suspension trailing arm for suspending a heavy vehicle chassis from a beam-type axle, the suspension trailing arm comprising:
- a chassis mounting formation;
 - a first cast or forged component including a first portion of an axle locating formation, and an integral arm portion extending between the first portion of the axle locating formation and the chassis mounting formation; and
 - a second component comprising a second portion of the axle locating formation and a bracket for mounting a spring;
- wherein the first portion and the second portion of the axle locating formation mate together to fully encircle a portion of a beam-type axle.
44. The suspension trailing arm according to Claim 43 wherein the second component is a cast or forged component.
45. The suspension trailing arm according to Claim 43 wherein the first component includes the chassis mounting formation that is integral with the integral arm portion.

46. The suspension trailing arm according to Claim 43 wherein the first portion and the second portion of the axle locating formation are each arranged to encircle substantially half of the beam-type axle.
47. The suspension trailing arm according to Claim 43 wherein the first portion and the second portion of the axle locating formation mate together at corresponding edges above and below the beam-type axle.
48. The suspension trailing arm according to Claim 47 wherein the suspension trailing arm includes welds connecting the corresponding edges above and below the beam-type axle.
49. The suspension trailing arm according to Claim 43 wherein the first portion of the axle locating formation includes a window aperture having a peripheral edge.
50. The suspension trailing arm according to Claim 49 including a beam-type axle, wherein a weld extending around a portion of the peripheral edge of the window aperture connects the beam-type axle to the axle locating formation.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None